GROUP 13B

FUEL SUPPLY

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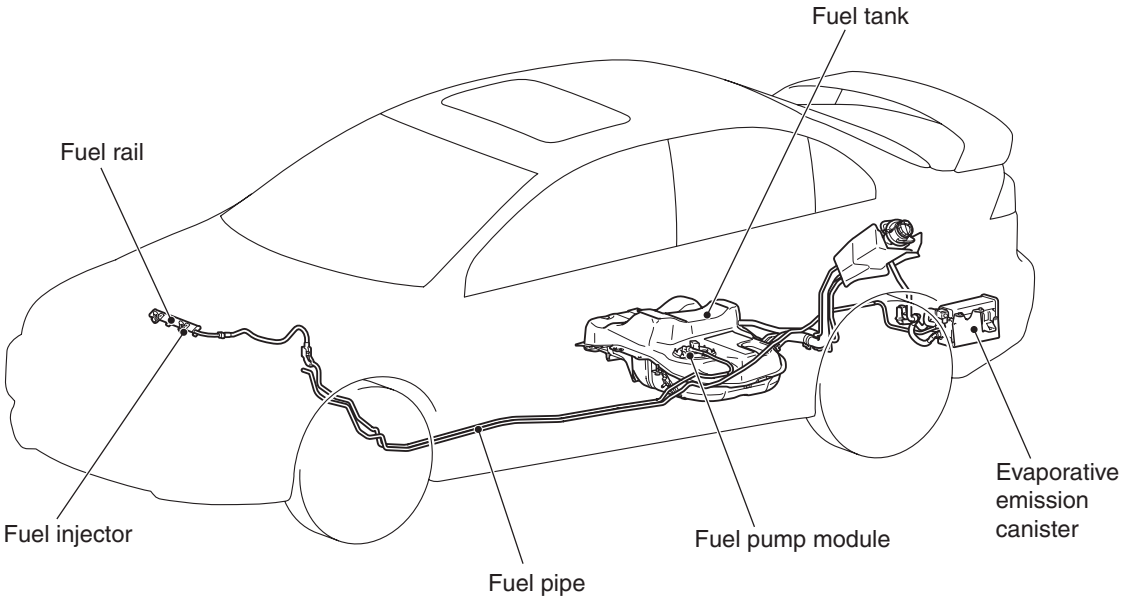
GENERAL INFORMATION

M1135000100877

This fuel system is designed with consideration for global environment protection to ensure safety at a collision, reduce weight, and improve reliability and quality. This system has the following features:

- A quick-joint connector is used for the fuel high-pressure hoses in the engine compartment to reduce the permeation of fuel evaporative emission.
- The surface of underfloor fuel pipes is coated with 1 mm (0.04 inch) thick plastic to improve resistance to corrosion and chipping.
- A returnless fuel system eliminates returned fuel from the engine. The heat that fuel receives from the engine is reduced, minimizing fuel temperature in the fuel tank and controlling the amount of evaporated gas.

CONSTRUCTION DIAGRAM



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FUEL SUPPLY DIAGNOSIS

INTRODUCTION

M1135004000441

The fuel system is used to supply an appropriate fuel mixture to the engine. The system consists of the fuel tank, fuel filter, fuel pump and fuel pipes. An evaporative emission system is provided to prevent evaporated fuel from escaping into the atmosphere.

Engine malfunctions caused by insufficient fuel supply and evaporative emission system operation malfunctions can be caused by faults in the vapor line, fuel pipe, hose, or fuel tank pressure control valve, etc.

TROUBLESHOOTING STRATEGY

M1135004100374

Use these steps to plan your diagnostic strategy. If you follow them carefully, you will be sure to find most of the fuel supply faults.

1. Gather information from the customer.
2. Verify that the condition described by the customer exists.
3. Find the malfunction by following the Symptom Procedure.
4. Verify malfunction is eliminated.

SYMPTOM PROCEDURES

M1135004800362

Inspection Procedure 1 : Engine Malfunctions Due to Insufficient Fuel Supply

TROUBLESHOOTING HINTS (The most likely causes for this case:)

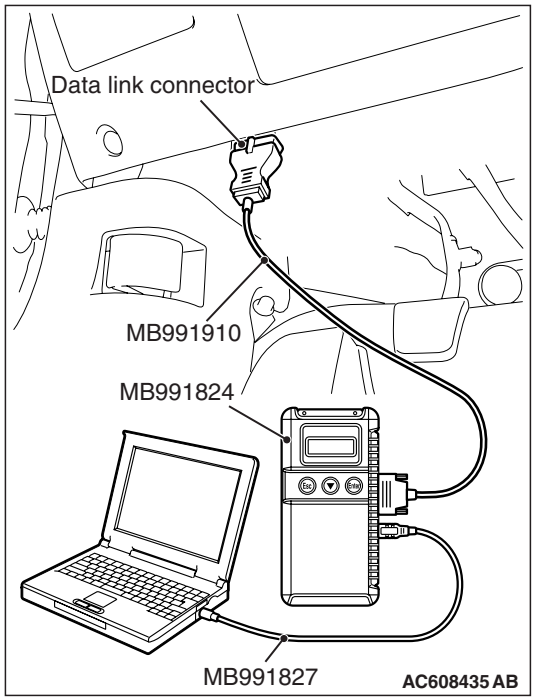
- Injector failed.
- Open or shorted injector circuit, or loose connector.
- Bent, twisted or clogged fuel pipe or hose.
- Malfunction of the fuel pump module.

DIAGNOSIS

Required Special Tools:

- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: V.C.I.
  - MB991827: USB Cable
  - MB991910: Main Harness A

STEP 1. Using scan tool MB991958, read the MFI system diagnostic trouble code.



⚠ CAUTION
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

(1) Ensure that the ignition switch is at the "LOCK" (OFF) position.
(2) Start up the personal computer.
(3) Connect special tool MB991827 to special tool MB991824 and the personal computer.
(4) Connect special tool MB991910 to special tool MB991824.
(5) Connect special tool MB991910 to the data link connector.
(6) Turn the power switch of special tool MB991824 to the "ON" position.

NOTE: When special tool MB991824 is energized, special tool MB991824 indicator light will be illuminated in a green color.

(7) Start the M.U.T.-III system on the personal computer.
(8) Turn the ignition switch to the "ON" position.
(9) Check for MFI system diagnostic trouble code (Refer to GROUP 13A –Diagnostic Function, How to Read and Erase Diagnostic Trouble Codes P.13A-10).
(10) Turn the ignition switch to the "LOCK" (OFF) position, and then remove scan tool MB991958 in the reverse order of installation.

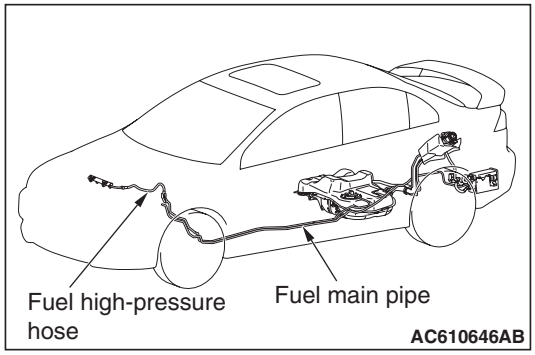
Q: Is the DTC set?

YES : Refer to GROUP 13A –Diagnostic Trouble Code Chart P.13A-46.
NO : Go to Step 2.

STEP 2. Check the fuel pressure.
Release residual pressure from the fuel line to prevent fuel spray. Refer to GROUP 13A –Fuel Pressure Test P.13A-929.

Q: Is the fuel pressure in good condition?
YES : Go to Step 5.
NO : Repair or replace. Then go to Step 3.

STEP 3. Check for bending, twisting or clogging of the fuel main pipe and fuel high-pressure hose.



Q: Are the fuel main pipe and fuel high-pressure hose in good condition?
YES : Go to Step 4.
NO : Repair or replace the fuel main pipe and fuel high-pressure hose. Then go to Step 6 .

STEP 4. Check the fuel pump module operation.
Refer to GROUP 13A –On-vehicles Service, Fuel Pump Operation Check P.13A-932.

Q: Is the fuel pump module operation in good condition?
YES : Then go to Step 5.
NO : Replace the fuel pump module (Refer to P.13B-9). Then go to Step 6.

STEP 5. Check the inside of the fuel tank for contamination and rust.
(1) Drain fuel.
(2) Remove the fuel tank (Refer to P.13B-9).

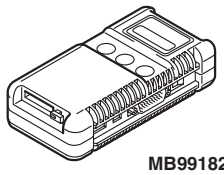
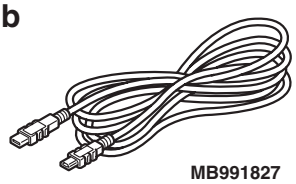
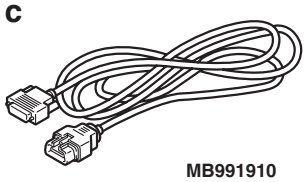
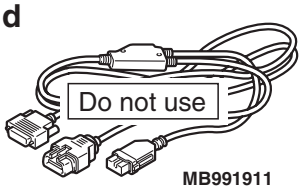
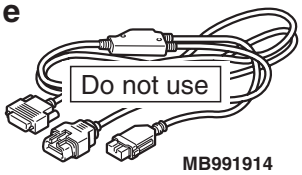
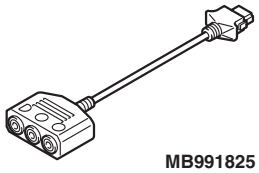
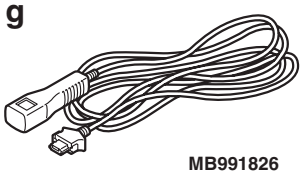
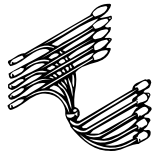
Q: Is the fuel tank in good condition?
YES : Go to Step 6.
NO : Replace the fuel filter, and clean the fuel tank and fuel line. Then go to Step 6 .

STEP 6. Retest the system.

Q: Is the engine malfunction eliminated?
YES : The procedure is complete.
NO : Return to Step 1.

SPECIAL TOOLS

M1135000600593

Tool	Tool number and name	Supersession	Application
a  MB991824 b  MB991827 c  MB991910 d  MB991911 e  MB991914 f  MB991825 g  MB991826 MB991958	MB991958 a: MB991824 b: MB991827 c: MB991910 d: MB991911 e: MB991914 f: MB991825 g: MB991826 Scan tool (M.U.T.-III sub assembly) a: Vehicle communication interface (V. C. I.) b: M.U.T.-III USB cable c: M.U.T.-III main harness A (Vehicles with CAN communication system) d: M.U.T.-III main harness B (Vehicles without CAN communication system) e: M.U.T.-III main harness C (for Daimler Chrysler models only) f: M.U.T.-III measurement adapter g: M.U.T.-III trigger harness	MB991824-KIT *NOTE: g: MB991826 M.U.T.-III Trigger Harness is not necessary when pushing V.C.I. ENTER key.*	**⚠ CAUTION** **For vehicles with CAN communication, use M.U.T.-III main harness A to send simulated vehicle speed. If you connect M.U.T.-III main harness B instead, the CAN communication does not function correctly.** Checking diagnostic trouble code
 MB991658	MB991658 Test harness set	Tool not available	Fuel tank differential pressure sensor check

ON-VEHICLE SERVICE

FUEL PUMP OPERATION CHECK

M1135001000497

Refer to GROUP 13A, On-vehicle Service –Fuel Pump Operation Check P.13A-932.

FUEL TANK GAUGE UNIT CHECK

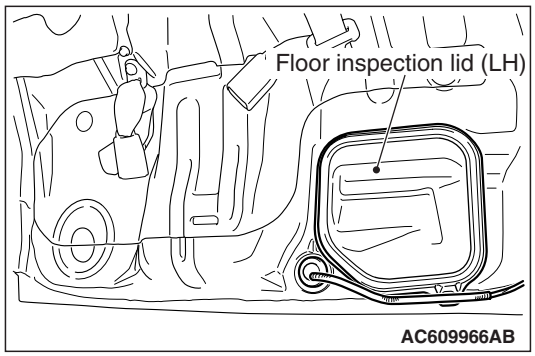
M1135003100768

Refer to GROUP 54A –Combination Meter, On-vehicle Service, Fuel Tank Gauge Unit Check P.54A-81.

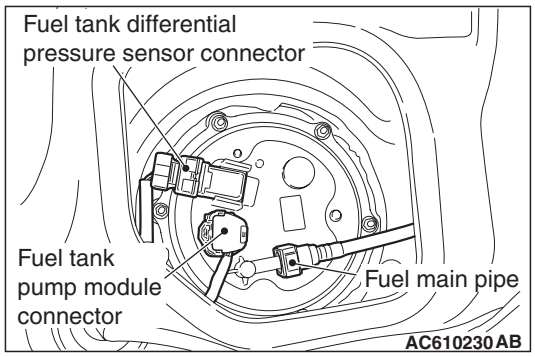
FUEL PUMP MODULE REPLACEMENT

M1135004900916

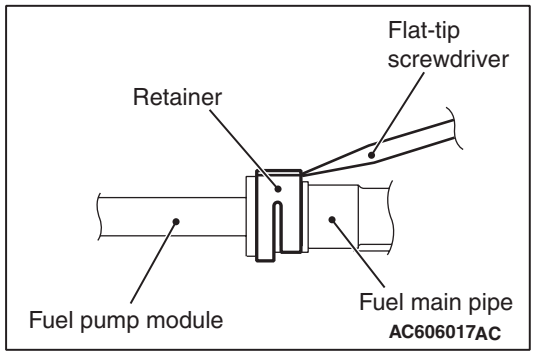
1. Remove the rear seat assembly (Refer to GROUP 52A – Rear Seat Assembly P.52A-23) and turn up the floor carpet.
2. Remove the floor inspection lid (LH).

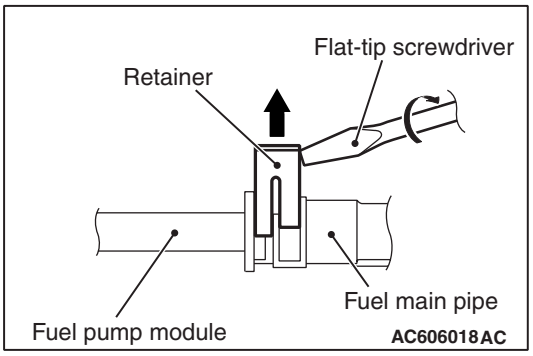


3. Disconnect the fuel pump module connector and fuel tank differential pressure sensor connector.
4. Release the fuel pressure in the fuel line. [Refer to GROUP 13A, On-vehicle Service - Fuel Pump Connector Disconnection (How to Reduce Pressurized Fuel Lines) P.13A-932].

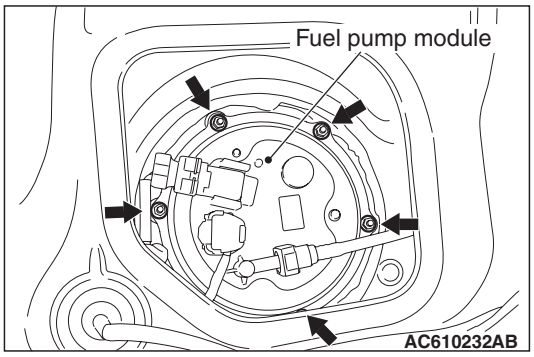


5. Insert a flat-tip screwdriver [6mm (0.24 inch) wide and 1mm (0.04 inch) thick] into the retainer of the fuel main pipe.





6. Turn the flat-tip screwdriver about 90 degrees to push up the retainer, and disconnect the fuel main pipe from the fuel pump module.



7. Remove the mounting nuts of fuel tank pump module.

⚠ CAUTION

Pay attention not to damage the fuel level sensor and float of the fuel pump module when removing the fuel pump module from the fuel tank.

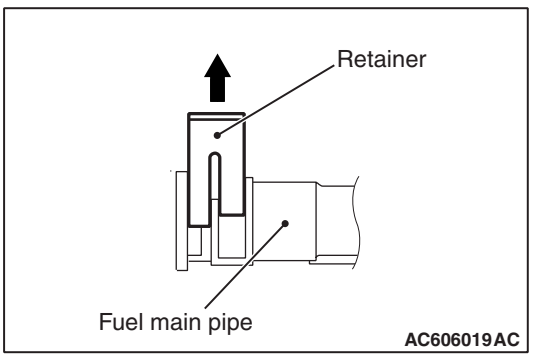
8. Remove the fuel pump module from service hole.
9. Replace the fuel pump module gasket with a new one.

⚠ CAUTION

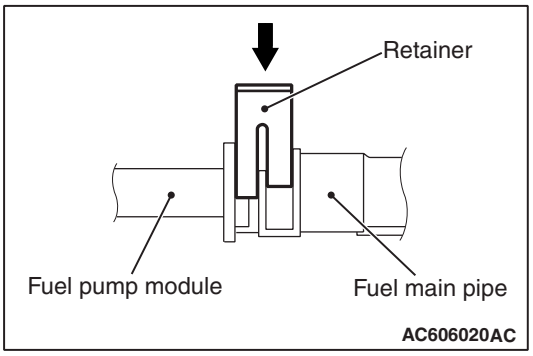
- **Pay attention not to damage the fuel level sensor and the float of the fuel pump module when installing it to the fuel tank.**
- **When installing the fuel pump module to the fuel tank, check that the fuel level sensor moving area moves smoothly.**

10. Install the fuel pump module to the fuel tank through the service hole, and tighten the mounting nuts to the specified torque.

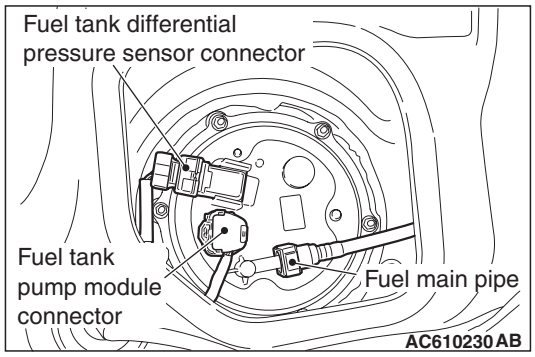
Tightening torque: 2.5 ±0.4 N· m (22 ±4 in-lb)



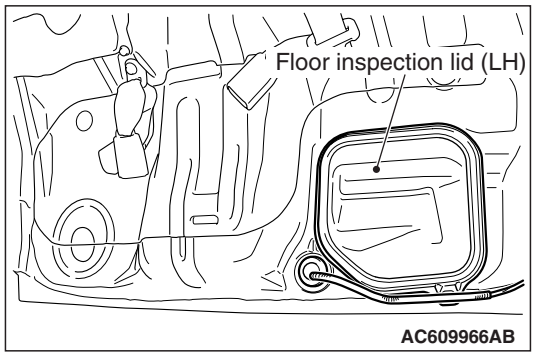
11. Before the installation, push up the retainer of the fuel main pipe.



12. Connect the connector of fuel main pipe to the fuel pump module securely and push down the retainer of the connector to lock it firmly.
13. After the installation, slightly pull the fuel main pipe to check that it is connected securely. At this time, also check that there is approximately 1 mm (0.04 inch) play.



14. Connect the fuel pump module connector and fuel tank differential pressure sensor connector.



15. Install the floor inspection lid (LH).
16. Return the floor carpet to the original condition and install the rear seat assembly (Refer to GROUP 52A –Rear Seat Assembly P.52A-23).

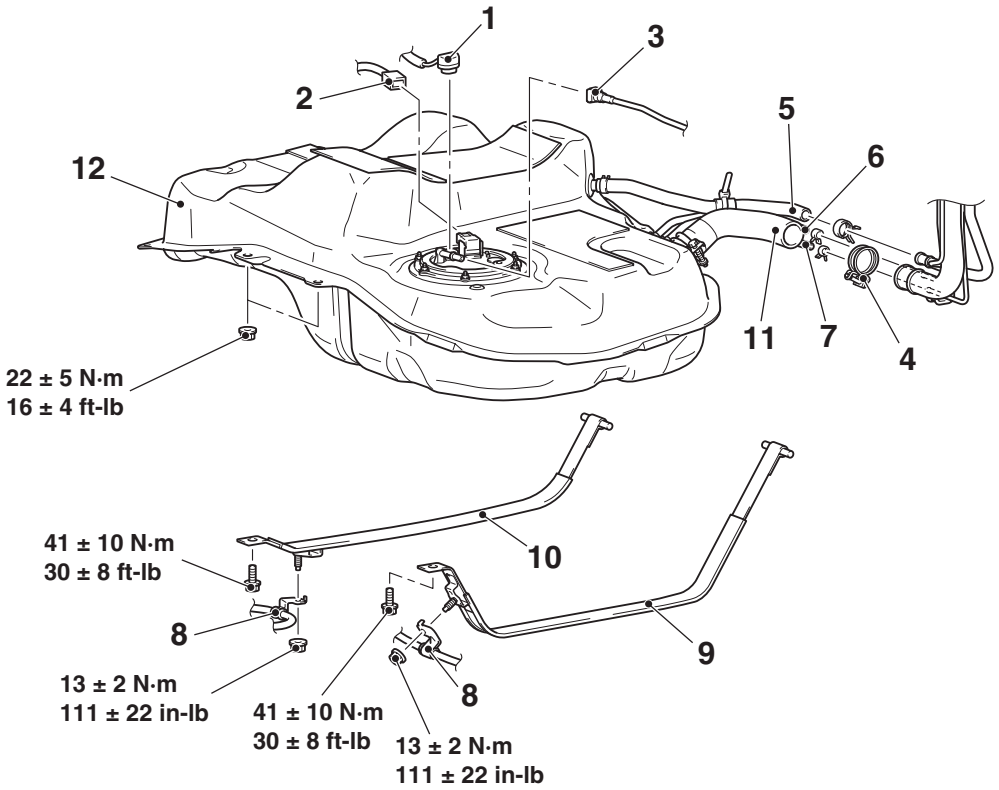
FUEL TANK

REMOVAL AND INSTALLATION

M1135001901653

<FUEL TANK>

Pre-removal operation	Post-installation operation
• Fuel Pump Connector Disconnection [Refer to GROUP 13A –On-vehicle Service, Fuel Pump Connector Disconnection (How to Reduce Pressurized Fuel Lines) P.13A-932]. • Fuel Draining • Front Floor Panel Rear Removal (Refer to GROUP 51 – Under Cover P.51-16). • Center Exhaust Pipe Removal (Refer to GROUP 15 – Exhaust Pipe and Main Muffler P.15-12).	• Center Exhaust Pipe Installation (Refer to GROUP 15 – Exhaust Pipe and Main Muffler P.15-12). • Front Floor Panel Rear Installation (Refer to GROUP 51 – Under Cover P.51-16). • Fuel Refilling • Fuel Leak Check.



AC610227AB

Removal steps

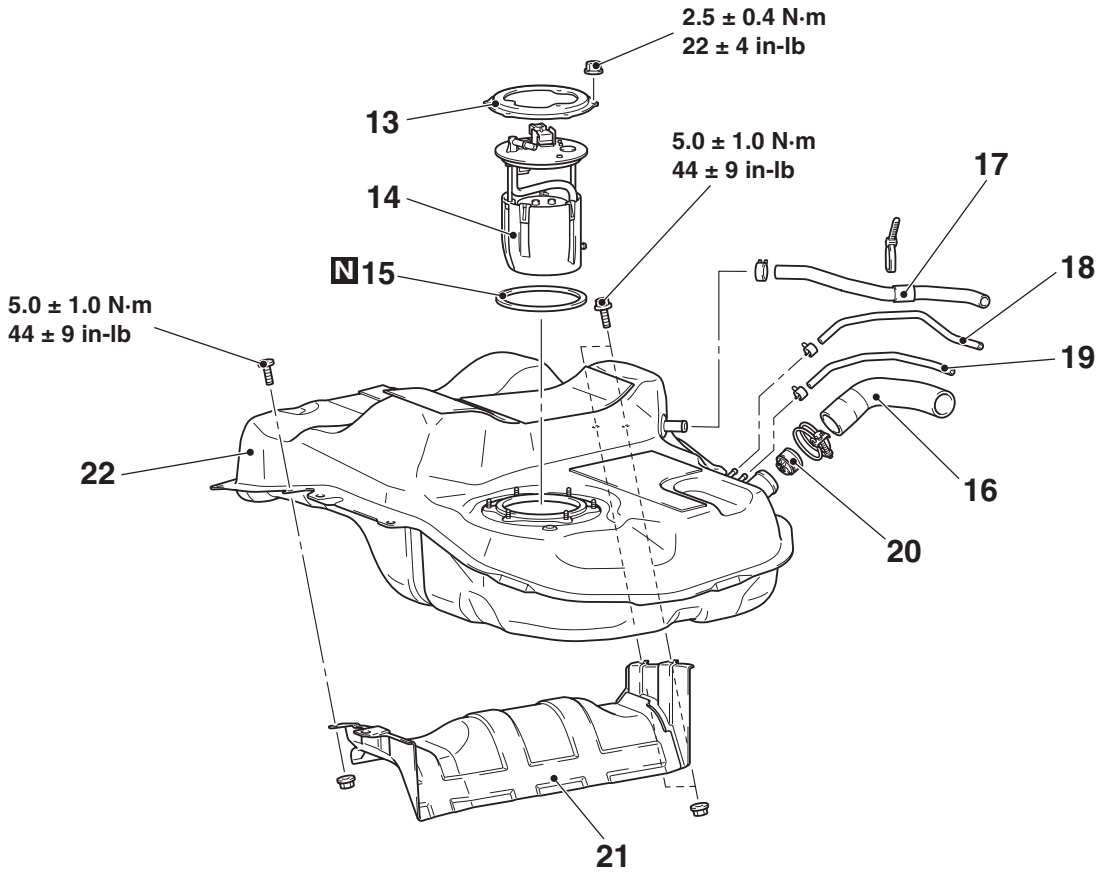
- Rear seat assembly (Refer to GROUP 52A –Rear Seat Assembly P.52A-23).

<<A>> 1. Fuel pump module connector
<<A>> 2. Fuel tank differential pressure sensor connector
<<A>> >>B<< 3. Fuel main pipe connection
4. Fuel filler hose clamp
5. Fuel leveling hose connection

Removal steps (Continued)

6. Fuel tank vapor hose (main) connection
7. Fuel tank vapor hose (return) connection
8. Parking brake rear cable clamp connection
<<B>> 9. Fuel tank band LH
<<B>> 10. Fuel tank band RH
<<C>> 11. Fuel filler hose connection
<<C>> 12. Fuel tank assembly

TSB Revision



AC610228AB

Removal steps

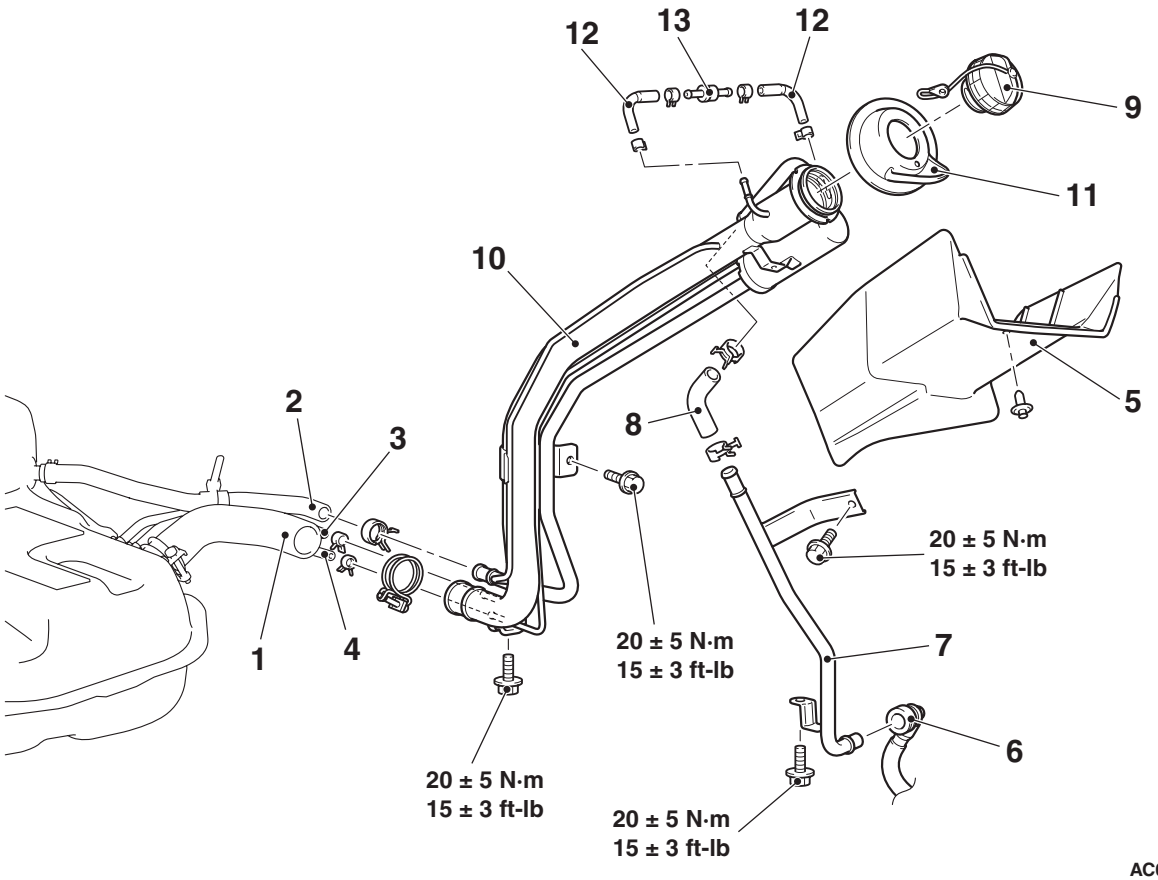
13. Plate
<<D>> >>A<< 14. Fuel pump module
15. Fuel pump module gasket
16. Fuel filler hose
17. Fuel leveling hose

Removal steps (Continued)

18. Fuel tank vapor hose (main)
19. Fuel tank vapor hose (return)
20. Fuel shut-off valve
21. Fuel tank lower protector
22. Fuel tank

TSB Revision

<FUEL TANK FILLER TUBE>



AC610229AB

Removal steps

1. Fuel filler hose connection
2. Fuel leveling hose connection
3. Fuel vapor hose (main) connection
4. Fuel vapor hose (return) connection
5. Filler filler hose protector
6. Fuel vapor tube connection

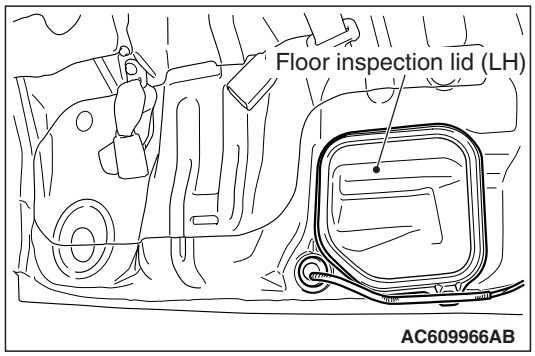
Removal steps (Continued)

7. Fuel leveling pipe
8. Fuel filler neck breather hose hose
9. Fuel cap
10. Fuel tank filler tube assembly
11. Filler neck boots
12. Fuel tank filler tube vapor hose
13. Check valve

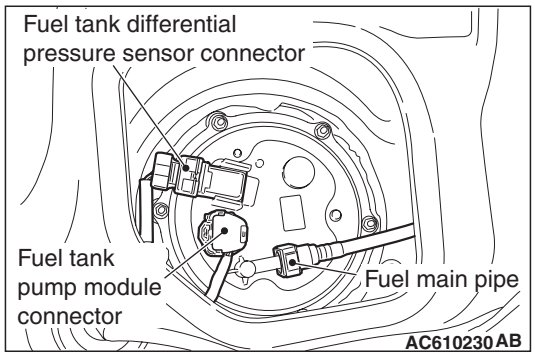
TSB Revision

REMOVAL SERVICE POINTS

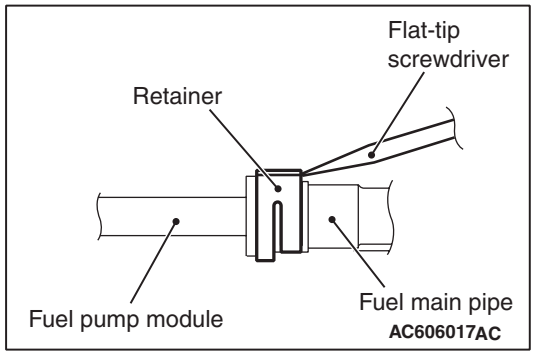
<<A>> FUEL PUMP MODULE CONNECTOR/FUEL TANK DIFFERENTIAL PRESSURE SENSOR CONNECTOR /FUEL MAIN PIPE DISCONNECTION



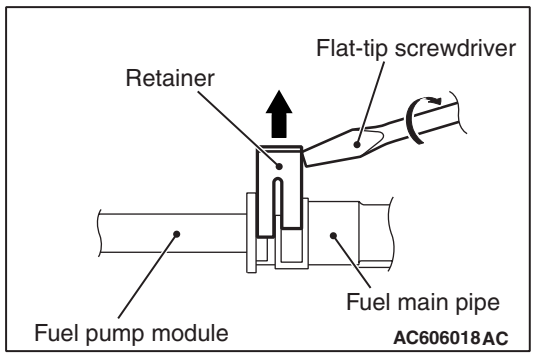
1. Remove the floor inspection lid (LH).



2. Disconnect the fuel pump module connector and fuel tank differential pressure sensor connector.
3. Release the fuel pressure in the fuel line. [Refer to GROUP 13A, On-vehicle Service - Fuel Pump Connector Disconnection (How to Reduce Pressurized Fuel Lines) P.13A-932].



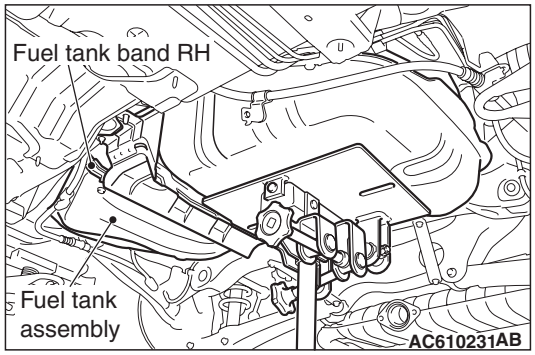
4. Insert a flat-tip screwdriver [6mm (0.24 inch) wide and 1mm (0.04 inch) thick] into the retainer of the fuel main pipe.



5. Turn the flat-tip screwdriver about 90 degrees to push up the retainer, and disconnect the fuel main pipe from the fuel pump module.

<<B>> FUEL TANK BAND LH/FUEL TANK BAND RH REMOVAL

1. Remove the fuel tank band LH.
2. Hold the fuel tank assembly with the transmission jack, and remove the fuel tank band RH.



<<C>> FUEL FILLER HOSE CONNECTION/FUEL TANK ASSEMBLY REMOVAL

1. Hold the fuel tank assembly using the transmission jack, and remove the mounting nuts.
2. Disconnect the fuel filler hose connection, and remove the fuel tank assembly.

<<D>> FUEL PUMP MODULE REMOVAL

⚠ CAUTION

Pay attention not to damage the fuel level sensor and float of the fuel pump module when removing the fuel pump module from the fuel tank.

INSTALLATION SERVICE POINTS

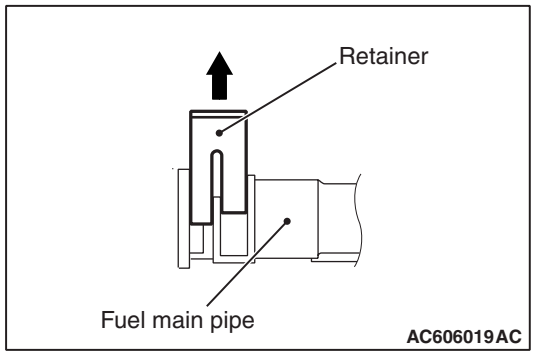
>>A<< FUEL TANK PUMP MODULE INSTALLATION

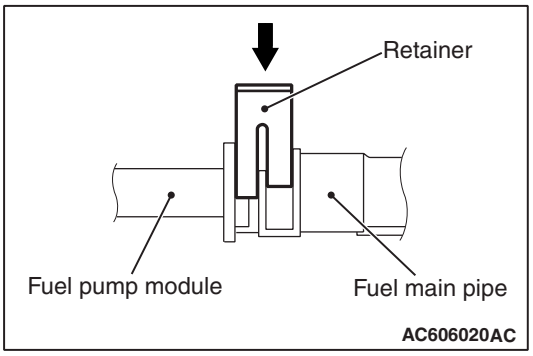
⚠ CAUTION

- **Pay attention not to damage the fuel level sensor and the float of the fuel pump module when installing it to the fuel tank.**
- **When installing the fuel pump module to the fuel tank, check that the fuel level sensor moving area moves smoothly.**

>>B<< FUEL MAIN PIPE CONNECTION

1. Before the installation, push up the retainer of the fuel main pipe.





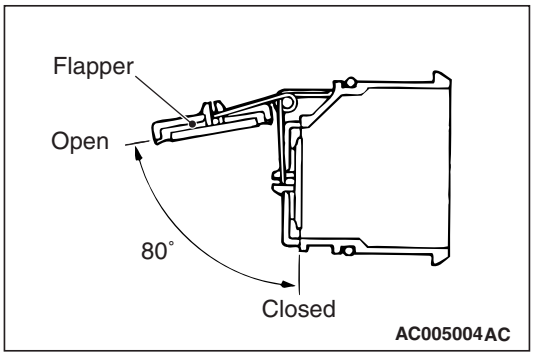
2. Connect the connector of fuel main pipe to the fuel pump module securely and push down the retainer of the connector to lock it firmly.
3. After the installation, slightly pull the fuel main pipe to check that it is connected securely. At this time, also check that there is approximately 1 mm (0.04 inch) play.

INSPECTION

M1135002000359

FUEL SHUT-OFF VALVE CHECK

Check that the flapper of the fuel shut-off valve opens and closes as shown in the illustration.



FUEL TANK DIFFERENTIAL PRESSURE SENSOR CHECK

Requird Special Tool:

- MB991658: Test Harness Set

1. Disconnect the fuel tank differential pressure sensor connector and connect special tool MB991658 between the terminals of the disconnected connector.
2. Turn the ignition switch to “ON” position and measure the voltage between terminal 1 and ground.

   Standard value: 2.0 –3.0 V